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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,259	03/31/2006	Issey Yamamoto	36856.1395	6013

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MURATA MANUFACTURING COMPANY, LTD.
C/O KEATING & BENNETT, LLP
1800 Alexander Bell Drive
SUITE 200
Reston, VA 20191

EXAMINER	
PATEL, ISHWARBHAI B	
ART UNIT	PAPER NUMBER
2841	

NOTIFICATION DATE	DELIVERY MODE
03/23/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JKEATING@KBIPLAW.COM
uspto@kbiplaw.com

Office Action Summary	Application No.	Applicant(s)	
	10/595,259	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Ishwar (I. B.) Patel	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-31* is/are pending in the application.

4a) Of the above claim(s) *20,21,23 and 26-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-19,22,24,25 and 29-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 30, 2008 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 16, 18, 19 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by applicant's prior art to Kengo (Japanese Patent Publication No. 2000-353872).

Regarding claim 16, Kengo in figure 1 discloses an internal conductor connection structure comprising: an insulator substrate (2) including a plurality of insulating layers (1); line conductors (4) disposed in the insulator substrate (see figure); and at least two via conductors adjacent each other (3, two of the vias on bottom of the figure) at a predetermined interval in the insulator substrate (see figure), at least one of the at least two via conductors including a continuous via conductor (5) arranged to extend in a direction away from the other via conductor (see figure); wherein the at least one of the at least two via conductors is connected to one of the line conductors (4) through the continuous via conductor (see figure), the continuous via conductor has a dimension in a direction in which the line conductors extend that is, greater than a dimension of the at least two via conductors in the direction in which the line conductors extend (see figure); the continuous via conductor is disposed in one of the plurality of insulating layers (see figure); one of the at least two via conductors is disposed in another one of the plurality of insulating layers that is different from the one of the plurality of insulating layers in which the continuous via conductor is disposed (see figure); and one end portion of the continuous via conductor is connected to the one of the at least two via conductors (see figure), and an opposite end portion, but not the one end portion, of the continuous via conductor is connected to the one of the line conductors (connected to line conductor 4, see figure).

Regarding claim 18, Kengo in figure 1 discloses a multilayer substrate comprising: a laminate (2) including a plurality of laminated insulator layers (1); at least

first and second via conductors (3, two on the bottom right of the figure) extending inside the laminate from positions adjacent to each other at a predetermined interval from a first main surface of the laminate (see figure); a first line conductor (4) connected to the first via conductor (via on the right side of the figure), the first via conductor including a first continuous via conductor (5) arranged to extend in a direction away from the second via conductor (see figure); wherein the first via conductor is connected to the first line conductor through the first continuous via conductor (see figure), the first continuous via conductor has a dimension in a direction in which the first line conductors extend that is greater than a dimension of the first via conductor in the direction in which the line conductors extend (see figure); the first continuous via conductor is disposed in one of the plurality of laminated insulating layers (see figure); the first via conductor is disposed in another one of the plurality of laminated insulating layers that is different from the one of the plurality of laminated insulating layers in which the first continuous via conductor is disposed (see figure); and one end portion of the first continuous via conductor is connected to the first via conductor (see figure), and an opposite end portion, but not the one end portion, of the first continuous via conductor is connected to the first line conductor (4).

Regarding claim 19, Kengo further discloses a third via conductor extending inside the laminate from the first main surface of the laminate (third of the vias on the bottom of the figure), the second via conductor includes a second continuous via conductor (continuous via with reference number 7 and 11, see figure) arranged to

extend in a direction away from both the first and third via conductors, wherein the second via conductor is connected to a second line conductor through the second continuous via conductor (see figure).

Regarding claim 22, Kengo further discloses first continuous via conductor and the second continuous via conductor penetrate through their respective insulator layers (see figure).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 17, 24, 25, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kengo as applied to claim 16 above, and further in view of Kondo (US Patent No. 6,855,625).

Regarding claim 17, Kengo discloses all the features of the claimed inventions as applied to claim 16 above including the line conductor, but does not disclose a connecting portion of the line conductor to the continuous via conductor or a connecting portion of the continuous via conductor that is connected to the line conductor is arranged to be a connecting land having an area larger than the connecting portion of the other conductor.

Kondo in figure 4A-4B discloses connecting portion of the line conductor (22) to be a land (22b) having an area larger than the connecting portion of the other conductor. This will facilitate enough connection area for a better electrical connection, even in case of a slight misalignment.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Kengo with the connecting land having an area larger than the connecting portion of the other conductor, as taught by Kondo in order to have better connection.

Regarding claim 24, Kengo discloses all the features of the claimed inventions as applied to claim 16 above including the first line conductor but does not disclose a connecting portion of the first line conductor to the first continuous via conductor or a connecting portion of the first continuous via conductor to the first line conductor is arranged to be a connecting land larger than the connecting portion of the other conductor.

Kondo in figure 4A-4B discloses connecting portion of the line conductor (22) to be a land (22b) having an area larger than the connecting portion of the other conductor. This will facilitate enough connection area for a better electrical connection, even in case of a slight misalignment.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Kengo with a connecting land

larger than the connecting portion of the other conductor as taught by Kondo in order to have better connection.

Regarding claim 25, Kengo discloses all the features of the claimed inventions as applied to claim 19 above including the second line conductor and second continuous via but does not disclose a connecting portion of the second continuous via conductor that is connected to the second line conductor or a connecting portion of the second line conductor that is connected to the second continuous via conductor is arranged to be a connecting land that is larger than the connecting portion of the other conductor.

Kondo in figure 4A-4B discloses connecting portion of the line conductor (22) to be a land (22b) having an area larger than the connecting portion of the other conductor. This will facilitate enough connection area for a better electrical connection, even in case of a slight misalignment.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Kengo with a connecting land larger than the connecting portion of the other conductor as taught by Kondo in order to have better connection.

Regarding claim 30, Kengo discloses all the features of the claimed inventions as applied to claim 16 above but does not disclose each of the via conductors and the line conductors individually include an electrically conductive material containing silver or copper.

However, use of silver or copper for via conductors and line conductors are old and known in the art. Kondo discloses use of such material (column 8, line 5-50).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Kengo with each of the via conductors and the line conductors individually include an electrically conductive material containing silver or copper, as taught by Kondo, to have desired electrical properties.

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Regarding claim 31, Kengo discloses all the features of the claimed inventions as applied to claim 16 above but does not disclose the first continuous via conductor only partially overlaps with the first via conductor.

Kondo discloses a continuous via conductor only partially overlaps with a via conductor (see figure 6A).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Kengo with the first continuous via conductor only partially overlapping with the first via conductor, as taught by Kondo to have desired flexibility in routing the vias and the line conductors.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kengo as applied to claim 16 above and further in view of Fukuta (US Patent No. 5,456,778).

Regarding claim 29, Kengo discloses all the features of the claimed invention as applied to claim 18 above including the insulating layers, but does not explicitly disclose the insulating layers are low temperature sinterable ceramic material. However, use of low temperature sinterable ceramic material, as disclosed by Fukuta (column 6, line 3-5) is old and known in the art for better via hole connection quality. Further the circuit board with ceramic material performs better in withstanding a higher temperature. Also, the structure of Fukuta is formed by laminating individual ceramic layers. The continuous via structures of Kondo will help in taking care of misalignment of the via structure.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to provide the structure of Kengo with the material as recited in the claim to have better performance at higher temperature.

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (571) 272 1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ibp
March 14, 2009

/Ishwar (I. B.) Patel/
Primary Examiner, Art Unit 2841